Medical Hypotheses 144 (2020) 110041

Contents lists available at ScienceDirect

Medical Hypotheses

journal homepage: www.elsevier.com/locate/mehy

Letter to Editors

Is SARSCoV-2 nasopharyngeal swab still a gold standard in children?

ARTICLE INFO

Keywords:
SARSCoV-2
COVID-19
Coronavirus
rRT-PCR
SARSCoV-2 antibodies
Swab SARSCoV-2

SARSCoV-2 is the virus responsible for the known world pandemic, which is worrying the highest international authorities [1,2]. The SARSCoV-2 genome was sequenced very early in the outbreak [1–4]. Currently, World Health Organization (WHO) recommends real-time reverse transcriptase–polymerase chain reaction (rRT-PCR) respiratory samples (i.e. nasopharyngeal and oropharyngeal swabs or sputum and/or endotracheal aspirate or bronchoalveolar lavage in patients) for suspicious cases [5].

However, in the adult the swab can give a false negative result if performed in the very early stages or in the late disease stage [6–8]. For the child nasopharyngeal and oropharyngeal swabs for suspicious cases is strongly in doubt and there are no evidences to support it as golden test.

The tests for IgG and IgM antibodies dosage are reliable and rapid tests, but they have limits of sensitivity and specificity that do not currently allow their use for disease diagnosis. Furthermore, because a new virus and in many respects still unknown, it is not certain known about the time needed to develop antibodies of the acute phase (IgM) [9].

We report the experience of our pediatric SARSCoV-2 center. From March 16th to May 16th, fifty-five children with suspected SARSCoV-2 or positive swab were hospitalized. The rRT-PCR nasopharyngeal swab used is with an analytical sensitivity of 100 copies/template. Among 55 children, six (10.9%) had been sent for positive nasopharyngeal swab performed for sudden fever and lack of appetite in positive family. Obtained informed consent, nasopharyngeal swab were collected after 24 h from previous one and resulted negative. In 5 of 6(83.3%), cough appeared and they underwent chest x-ray negative for pnumopathy. Subsequently for clinical worsening and dyspnea appearance a chest CT scan was performed which showed bilateral pneumonia compatible with SARSCoV2 (Fig. 1).

These preliminary data support the suggestion that nasopharyngeal swab is not the gold standard for diagnosis in children. The low affinity and volatility of the virus to the little expressed ACE2 receptors in the child could explain the rapid negativity of the swab. An accurate, easy and quick test is needed, to identify infected subjects and especially asymptomatic carriers, such as children. The specific antibody dosage for the virus could be a good diagnostic choice. The SARSCoV-2 swab is effective in adults but not in children, probably for the above reasons of low susceptibility to the infection. To our knowledge, there are no studies regarding the low sensitivity and specificity of the nasopharyngeal swab in children. In conclusion, our study suggests that nasopharyngeal and/or oropharyngeal swab may not suitable to confirm SARSCoV-2 infection in children.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

https://doi.org/10.1016/j.mehy.2020.110041
Received 17 June 2020; Accepted 23 June 2020
Available online 26 June 2020

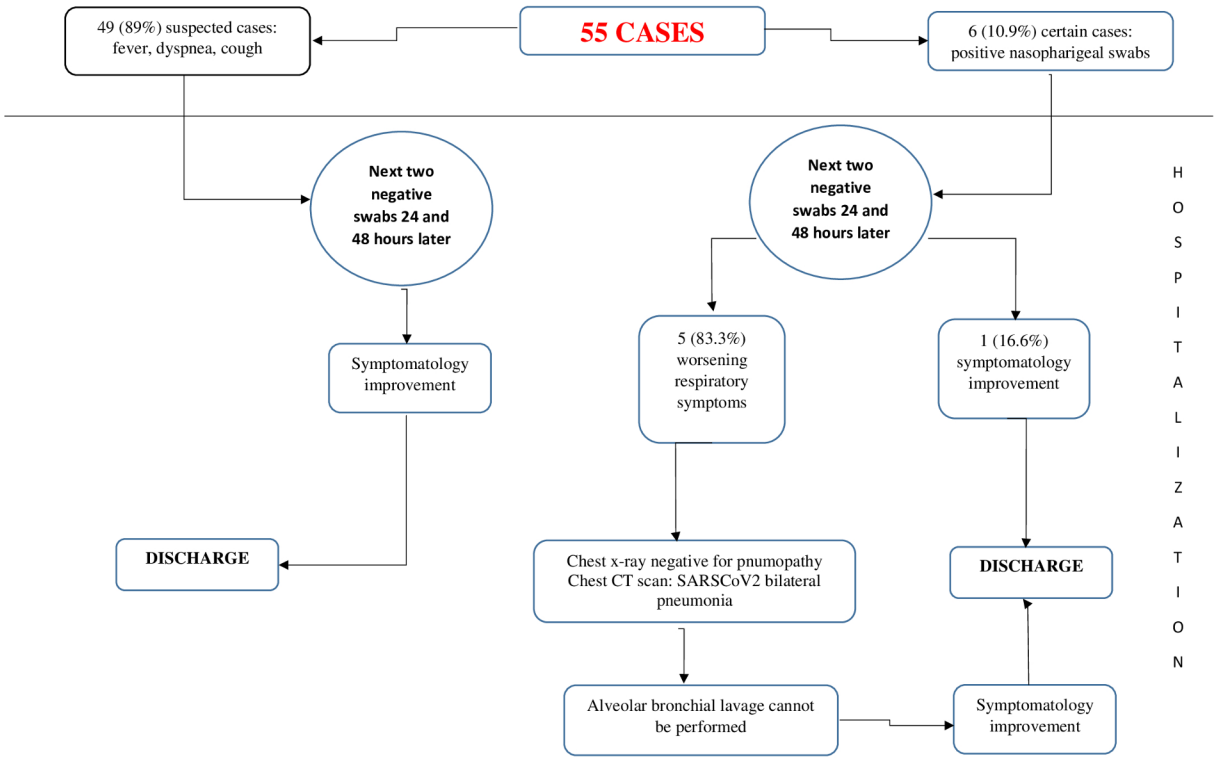

Fig. 1. Pediatric SARSCOV2 and rapid swab negativity.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.mehy.2020.110041.

References

[1] Li Q, Guan X, Wu P, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. New Engl J Med 2020. https://doi.org/10.1056/NEJMoa2001316.
[2] Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med 2020;382:727–33.
[3] Tan W, Zhao X, Ma X, et al. Notes from the field: a novel coronavirus genome identified in a cluster of pneumonia cases—Wuhan, China 2019–2020. China CDC Weekly 2020;2(4):61–2.
[4] Lu R, Zhao X, Li J, et al. Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. Lancet 2020;395(10224):565–74. https://doi.org/10.1016/S0140-6736(20)30251-8.
[5] World Health Organization. Novel Coronavirus (2019-nCoV) technical guidance: Laboratory 62testing for 2019-nCoV in humans. (https://www.who.int/emergencies/diseases/novel-coronavirus-632019/technical-guidance/laboratory-guidance).
[6] Zitek T. The Appropriate use of testing for COVID-19 West J Emerg Med. 2020 Apr 13. doi: 10.5811/westjem.2020.4.47370. [Epub ahead of print].
[7] Winichakoon P, Chaiwarith R, Liwsrisakun C, et al. Negative nasopharyngeal and oropharyngeal swab does not rule out COVID-19. J Clin Microbiol. 2020 Feb 26. pii: JCM.00297-20. doi: 10.1128/JCM.00297-20. [Epub ahead of print].
[8] Feng H, Liu Y, Lv M, Zhong J. A case report of COVID-19 with false negative RT-PCR test: necessity of chest CT. Jpn J Radiol 2020 Apr 7. doi: 10.1007/s11604-020-00967-9. [Epub ahead of print].
[9] Gallagher J. Are coronavirus tests flawed? BBC News. wwwbbccom/ ews/ health-51491763. Accessed 13 February, 2020.

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